

Claims

1. A temperature sensing system configured for use with a variable reluctance sensor consisting of a electrical conductor winding carrying a magnetically induced alternating current voltage signal, the
5 temperature sensing system comprising:
a set of electrical components operatively coupled in a Wheatstone bridge configuration with said electrical conductor winding, said set of electrical components including a plurality of resistors, and said Wheatstone bridge configuration operatively coupled to an
10 electrical ground;
a constant voltage source operatively coupled to said Wheatstone bridge configuration;
a first capacitive filter circuit operatively coupled to a first node of said Wheatstone bridge configuration, said capacitive filter circuit
15 configured to pass only the magnetically induced alternating current voltage signal from said electrical conductor winding; and
a second capacitive filter circuit coupled to said node comprising at least one resistor and one capacitor, said second capacitive filter circuit configured to pass only a temperature dependant DC voltage
20 signal from said electrical conductor winding.
2. The temperature sensing system of Claim 1 further including a differentiator circuit operatively coupled to said second capacitive filter circuit and to a predetermined electrical potential, said differentiator circuit configured to output a temperature dependant DC
25 voltage signal referenced to said predetermined electrical potential.
3. The temperature sensing system of Claim 1 wherein said predetermined electrical potential is said electrical ground.
4. The temperature sensing system of Claim 1 wherein at least one of said plurality of resistors is selected to provide bias
30 adjustment of said DC voltage signal representative of said temperature, whereby said DC voltage signal has a predetermined value for a corresponding predetermined temperature.

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said second capacitive filter circuit is operatively coupled between said second and third nodes;

said constant voltage source is operatively coupled to said fourth node; and

5 said electrical ground is operatively coupled to said fifth nodes.

9. The temperature sensing system of Claim 8 wherein said second capacitive circuit is configured to provide said DC voltage signal representative of a temperature of the electrical conductor winding in a ratio of :

10
$$\frac{R5}{(R4 + R5)}$$

wherein

R4 is the electrical resistance of said fourth resistor; and

R5 is the electrical resistance of said fifth resistor.

10. The temperature sensing system of Claim 7 wherein said
15 first, second, and third resistors are selected to provide bias adjustment of said DC voltage signal representative of said temperature, whereby said DC voltage signal has a predetermined value for a corresponding predetermined temperature.

11. The temperature sensing system of Claim 1 wherein said
20 first capacitive filter circuit consists of a first capacitor coupled at an input side to said first node of said Wheatstone bridge configuration.

12. The temperature sensing system of Claim 11 wherein said
first capacitive filter circuit further includes a voltage follower operatively
coupled between an output side of said first capacitor and an input side
25 of a second capacitor;

a resistor coupled between an output side of said second capacitor and an electrical ground; and

wherein said resistor is selected to have a nominal electrical resistance substantially corresponding to the electrical resistance of the

coupled between an output side of said first capacitor and an input side of a second capacitor;

a resistor coupled between an output side of said second capacitor and a capacitive connection to an electrical ground; and

5 wherein said resistor is selected to have a nominal electrical resistance substantially corresponding to the electrical resistance of the electrical conductive winding at an ambient temperature.

17. A method for utilizing an electrical conductive winding generating magnetically induced alternating current voltage signals in a variable reluctance speed sensor as a temperature sensor, comprising
10 the steps of:

supplying a constant voltage to the electrical conductive winding through a voltage drop resistor, said constant voltage superimposing a direct current voltage signal with said magnetically induced alternating
15 current voltage signal, said direct current voltage signal quasi-proportional to a temperature of the electrical conductive winding;

extracting, at a first output point, said temperature proportional direct current voltage signal from said superimposed direct current and alternating current voltage signal; and

20 extracting, at a second output point, said original alternating current voltage signal from said superimposed direct current and alternating current voltage signal

18. The method of Claim 17 further including comparing said extracted temperature proportional direct current voltage signal with a
25 predetermined voltage signal.

19. The method of Claim 18 wherein said predetermined voltage signal is an electrical ground.

20. The method of Claim 18 wherein said predetermined voltage signal is representative of a temperature limit, and further
30 including the step of signaling an alarm if said extracted temperature proportional direct current voltage signal represents a temperature which is at least equal to said temperature limit.

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filter circuit configured to improve said DC voltage signal quality during a switch-on phase of said constant voltage source.